OPTICAL INSPECTION TECHNOLOGIES

Technologies which allow materials, products and packaging to be inspected at manufacturing speeds for defects that would be visually apparent to an observer, given sufficient observation time.

Status:

Only a few years ago the real time inspection of our products was not feasible using digital imaging technology. At that time optical processing (using optical transforms and/or optical computing) was the technology of choice. However recent developments in high speed cameras, high volume information storage, high speed computing and computing algorithms have made on-line package inspection possible and placed individual cigarette and on-press print inspection within reach. The current technical challenges center on the reproducible and stable presentation of objects to the camera and on the development of very high resolution, high speed cameras or electrooptic scanners.

Likely Scenario:

Developments in digital imaging are expected to continue, driven by an estimated $5B world market ($3.3-4.3B U.S.) by the year 2000*. We anticipate the installation of pack inspection systems on all modules by 1992. Imaging and processing capabilities for print web and 100% on line cigarette inspection are expected to be available by 1994. Adaptation of these developments to our applications will produce significant benefits in quality and machine utilization.

Developments in morphological image processing are expected to lead to on-line methods of characterizing tobacco streams (size, shape, texture, color) and the identification of foreign materials.

Alternate Scenarios:

Very high speed inspection is needed by relatively few industries (cigarettes, beverages, pharmaceuticals and printing.) These markets may not be sufficient to motivate commercial development of high speed systems.

Unexpected technical barriers may preclude the attainment of the required speeds and resolution by digital technologies - or unexpected breakthroughs may occur in optical processing or computing.

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Source: https://www.industrydocuments.ucsf.edu/docs/frkl0000

R&D Response:

Continued or expanded effort is needed to achieve the goal of 100% pack inspection and to develop or adapt high speed imaging and processing to our needs. Close coordination between R&D and Engineering will be necessary.

The development of digital imaging technologies must be monitored closely, as must the business progress of the (generally small) vision system vendors. We should stay abreast of progress in the optical processing/computing areas in the event that optical implementations prove necessary or desirable.

Recently initiated sponsored research in morphological processing (Carnegie Mellon University) should be followed closely to determine the potential of this technology for tobacco inspection.

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